A LONGITUDINAL STUDY OF THE EFFECTS OF ORGANIZATIONAL CHANGE TO INTEGRATED PRODUCT TEAMS (IPTS) ON EMPLOYEE ATTITUDES

THESIS

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Preface

This study examines what effect organizational change to Integrated Product Teams (IPTs) within an ASC System Program Office (SPO) has on employee attitudes. As more organizations within Air Force Materiel Command (AFMC) change their structures to utilize IPTs, it has become more important for managers to understand the effects of this change on employee attitudes.

This study presents a longitudinal study of a SPO which implemented IPTs. The findings and recommendations of this study are valuable to organizations and researchers interested in the implementation of IPTs, and what effects IPTs have on individual attitudes.

In writing this thesis, we had a great deal of help from others. We are deeply indebted to our thesis advisors, Major Bob Pappas and Major Rod Rice, for their guidance and patience with us. Thanks also to the SPO personnel who assisted us in collecting data and information related to the study. Last, but certainly not least, we wish to thank our wives, Lisa Stull and Julie Paul, for their understanding and patience throughout the entire AFIT and thesis experience.

Roger D. Stull

Joseph A. Paul

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Abstract

This study examines what effect an organizational change to Integrated Product Teams (IPTs) within a System Program Office (SPO) has on employee attitudes. Chapter One of this study presents the general research problem/issue, pertinent background information, definitions of important terms, investigative questions, limitations of the research, and a general overview of the thesis. Chapter Two describes the IPT (matrix) organizational environment, presents literature establishing the relationship between individual attitudes, motivation, performance, and explores the relationship between IPTs and employee attitudes. Chapter Three presents the methodology used to analyze the SPO's survey data collected before and after implementation of IPTs. Finally, Chapters Four and Five present the survey data results, findings of the analysis, and recommendations for organizations interested in implementing IPTs. The SPO surveys conducted during study suggest the change to IPTs was properly managed as there was no change in attitudes.

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I. Introduction

General Issue

An extensive amount of literature exists on the topics of human motivation, individual needs, and management of individuals. However, limited literature exists addressing the topic of how to motivate individuals, who have unique personalities and personal agendas, within a matrix organization with Integrated Product Teams (IPTs). There is a need within the Air Force and commercial sector to explore the impact restructuring to a matrix organization (and specifically, to the structure of IPTs) has on individual employee attitudes (Chambers, 1989:41).

This study examines the importance of satisfying employee needs when attempting to improve organizational performance with a change to an IPT structure. This study uses survey data collected by one SPO as part of their Total Quality Management (TQM) effort to improve the performance, efficiency, and effectiveness of their operations.

The next two sections provide definitions of key terms and concepts discussed throughout the study. This is followed by background information that facilitates an

understanding of the underlying concepts of the study and their significance.

Definition of Terms

The following are definitions of key terms and concepts.

Matrix Organizational Structure. A matrix organizational structure is:

> an organization design in which individuals from various functional (line) departments are assigned, usually on a temporary basis, to a project manager who is responsible for accomplishing some specific task (a "project") in accordance with specifications, within budget, and on time. At the completion of the project, or at some intermediate point, the individual returns to the functional (parent) organization. (Chambers, 1989:37)

Integrated Product Teams. Integrated Product Teams (IPTs):

> follow the principles of integrated product development, also known as concurrent engineering. Their focus is on a specific development, integration, and product support which demands the expertise of many, if not all, functional areas at both the product and logistics centers as well as appropriate membership for organizations external to the SPD, System Program Director. They are the principal tool the SPD has for ensuring a weapon system satisfies all user requirements. (DAF, 1992:215)

Motivation. The idea that individual motivation influences performance is an important concept for managers to understand. Motivation is defined as the "concept that describes forces acting on employees that initiate and direct behavior" (Gibson, Ivancevich and Donnelly, 1991:99).

Individual Needs. Gibson said, "Needs are energizers or triggers of behavioral responses. The implication being that when needs (deficiencies) are present, the individual is more susceptible to managers' motivational efforts" (Gibson and others, 1991:99). Needs are defined as "deficiencies that an individual experiences at a particular point in time" (Gibson and others, 1991:99).

Background Information

The following sections provide pertinent background and conceptual information concerning IPTs, information about the environment within which ASC SPOs function, and potential impacts of change on SPO individuals.

Environmental Influences. The Department of Defense (DOD) is undergoing a major reduction in forces that is expected to decrease the number of DOD personnel by at least twenty-five percent over the next three years. During this reduction, the DOD is trying to achieve a previously established TQM goal that increases productivity by twenty percent (Burstein and Sedlak, 1988:38-41). As a result, DOD managers must determine a means to do more with less. In their efforts to improve efficiency by using TQM principles, the Aeronautical Systems Center (ASC) at Wright-Patterson Air Force Base (WPAFB) began implementing a new matrix organizational structure called IPTs in its SPOs.

Integrated Product Teams. The sample SPO studied bases its operations upon the IPT structural design. IPTs are the

cornerstone of the organization's integrated approach to weapons systems development and support.

IPTs maintain close control of the most important and time sensitive elements within a weapon system acquisition program. Where commodities are managed outside the weapon system's organization, individuals from the outside agencies are required to be active members of the IPTs. As stated by the Department of the Air Force (DAF), it:

> is critical to ensuring smooth continuity of operations and proper commodity management in support of the weapon system. IPTs are the foundation of weapon systems programs (such as the F-15) single management concept. (DAF, 1992:216)

IPTs bring together the required functional, development, and support expertise needed for a program by working along and across organizational lines to execute early development, modification, and support programs (DAF, 1992:215). The functional capabilities of ASC SPOs are well-suited for the implementation of IPTs within the matrix organization. Under the Integrated Weapon System Management (IWSM) concept, the System Program Director (SPD) fulfills the role of the project manager of an IPT.

IWSM. The three major objectives of IWSM are to provide: 1) cradle-to-grave management; 2) a single face to the system user; and 3) a seamless organization (DAF, 1992:15-16). The SPD relies on many functional areas during the life-cycle of the system. Some of the functional area personnel assigned to IPTs come from engineering, contracting, accounting, and logistics. Under the IPT

structure, the SPD has more authority over functional personnel than what is typically found in matrix organizations.

With continued reductions of DOD personnel, the SPDs cannot maintain a staff of functional specialists. With the TQM objective to increase productivity, SPDs must establish more efficient means for using limited resources. In order to increase productivity with less personnel, significant pressure for improvement is required in the performance level and productivity of IPT members. This pressure for improved performance could impact employee attitudes.

Change. During the transition to IPTs, SPO employees must deal with change. People are ordinarily reluctant to accept change, yet in projects, change is the norm. Even planned organizational change is different from what has previously occurred. Changes are usually initiated by leaders of organizations and are the result of external environmental influences rather that human resource specialists (Nadler and Tushman, 1989:194). The changes at ASC are not an exception to this trend. Washington initiatives to consolidate, and declining personnel resources are some of the driving forces behind the change to IPTs.

The effects of organizational change should not be dealt with lightly, nor should they be viewed as something that happens and will simply take care of itself with the passage of time. Lawrence said, "All too often when

executives encounter resistance to change, they 'explain' it by quoting the cliche that 'people resist change' and never look further" (Lawrence, 1969:145).

Problem Statement

This research examines the effect restructuring to IPTs within ASC SPOs has on individual attitudes within the work place. This is important due to the impact attitudes have on motivation, and ultimately, organizational performance and effectiveness.

Motivation and Individual Needs

Before a manager can motivate an individual, the manager needs to understand the behavior and attitudes of that individual. Individual behavior and attitudes are affected by the satisfaction of several basic needs.

Maslow's Hierarchy of Needs. When referring to Maslow's "Needs Hierarchy Model", Gibson states "that a person's needs depend on what he or she already has. In a sense then, a satisfied need is not a motivator. Human needs, organized in hierarchy of importance, are physiological, safety, belongingness, esteem, and self-actualization" (Gibson and others, 1991:102). Maslow's theory assumes that people attempt to satisfy more basic needs such as physiological needs (need for food, drink, etc.) before directing behavior toward satisfying upper level needs such as needs for esteem or self-actualization (Gibson and others, 1991:103).

Table 1 shows common expectations individuals have of team managers/leaders to aid the individuals in satisfying their needs.

TABLE 1

BASIC NEEDS OF TEAM MEMBERS

NEEDS	TEAM EXPECTS FROM MANAGER
Sense of belonging	Direction and Leadership
Interest in work itself	Assistance in problem-solving
Professional achievement	Create stimulating environment
Encouragement, pride	Adaptation of new members
Recognition of work	Capacity to handle conflict
Protection from infighting	Resistance to change
Potential for career growth	Facilitate career growth
Job security/continuity	Representation with top management

(Thamhain, 1984:485)

Because motivation is difficult to measure, our investigative questions measure what effect SPO restructuring to IPTs has on some individual needs and attitudes presented in Table 1.

Investigative Questions

This research used secondary or historical survey data. This is addressed in the next section dealing with the scope and limitations of the study. Therefore, this research of employee attitudes after change to IPTs was limited to the following questions:

Investigative Question #1: What was the effect of this structural change on job interest/satisfaction?

Investigative Question #2: What was the effect of this structural change on pride in workmanship?

Investigative Question #3: What was the effect of this structural change on employee recognition?

Investigative Question #4: What was the effect of this structural change on manager support of employees?

Investigative Question #5: What was the effect of this structural change on attitudes toward the TQM Program.

Scope/Limitations of this Study

This study reviews employee attitudes before and after a change to the IPT organizational structure. Because the IPT structure is relatively new to ASC, the population of interest for this study is limited to four SPOs within ASC that have already undergone the change to IPTs, and others who may anticipate a similar change. As part of a TQM initiative, one SPO measured employee attitudes before and after the change to IPTs. Therefore, it was selected as the sample group for the study. In order to analyze the effect of this organizational change to IPT's, this study used an ex post facto analysis of the sample SPO's historical survey data.

General Limitations. One limitation using the SPO's data is that their survey was designed to assess the organization's performance and effectiveness in many areas

in addition to employee attitudes. The SPO survey does not address all individual needs listed in Table 1, which limited the number of investigative questions to five. Ideally, more than one survey question per investigative question would improve internal validity and reliability. However, the SPO survey had only one corresponding question for three of the investigative questions.

Data Collection Limitations. For purposes of the SPO, individual responses to all questions were not identified and maintained separately; instead, responses were compiled by sections within the organization. Therefore, the entire organization's mean responses (with standard deviations) to the survey questions, both before and after the change to IPT's, had to be used in order to analyze the relationship between employee attitudes and organizational change to IPT's.

Thesis Overview

Determining what effects a change to IPTs within a SPO have on employee attitudes is the purpose of this study. As more SPOs within AFMC begin to use IPTs, it is important for managers to understand what effects this change may have on employee attitudes, because attitudes are potential indicators of future organizational performance and effectiveness.

Chapter One presented the general issues and problems of interest to this research effort. Chapter Two presents

literature that facilitates understanding of the matrix and IPT organizational environments. Chapter Two also presents literature addressing the relationship between the matrix form of organization and employee attitudes. Chapter Three presents the methodology used to analyze the SPO's survey data. Chapter Four presents the analysis of procedures used on the SPO's survey data. Finally, Chapter Five presents the findings from the analysis of the SPO's survey data, and recommendations for organizations.

II. Literature Review

Introduction

An organizational structure change from a basic form of matrix organization to fully implemented IPTs could have a major impact on individuals' attitudes. It is important for managers to understand this potential impact on attitudes because employee attitudes ultimately effect organizational performance (Gibson and others, 1991:12).

First, this chapter presents literature pertinent to understanding the basic concepts, pros and cons, and unique aspects of matrix organizations and IPTs. Second, literature is presented to further outline IPTs. Third, this chapter examines organizational change and its potential impact on individuals. Fourth, the relationship between the IPT/matrix form of organization and employee attitudes is discussed, and finally, this chapter concludes with a short summary of key points.

The Matrix Organization Environment

As discussed in Chapter One, matrix organizations are made up of two primary departments/sections, the functional management and project management. The next section presents aspects of the functional management department portion of a typical matrix organization to demonstrate how it differs from IPTs.

Functional Management. The typical functional department/section within a matrix organization consists of specialists, or a team of specialists, assigned to a common area such as engineering, contracting, and accounting. In some matrix structures the specialists report to a functional manager and work on tasks for a project department. In other matrix structures, specialists are co-located in the project department and report primarily to the project manager. The functional specialist usually works on a project until it is complete or reaches a stage when the functional specialty is no longer required. When a specialty is no longer required for a project, the functional specialist moves to a different project team.

The primary roles of the top manager of the functional section of a matrix structured organization include the following: knowledge updator, technical consultant, task manager, technical administrator, employee developer, and organizational developer. These roles can be placed into the following categories: updating education, task/project management, and people/resources management. The knowledge updator role involves maintaining and improving skills and expertise of the subordinates to assure the subordinates remain current in their technical area. As a technical consultant, the functional manager assists the specialists in solving technical problems as they occur. The task manager role includes integrating the specialist's functional and project tasks with the project manager to

assure there are no conflicts. The technical administrator role includes working with the administrative offices and enforcing company policy. As an employee and organizational developer, the lead functional manager should guide subordinates in their careers and adapt functional resources to the environment (Jerkovsky, 1983:89-92).

The following section describes the other half of a typical matrix organization, the project management department/section.

Project Management. Project managers are made responsible for accomplishing certain tasks in accordance with specifications, within a given budget, and by a specified time (Chambers, 1989:37). The specified task may include anything from modifying a piece of support equipment to designing and producing an aircraft. In every project, the project manager assigns and coordinates functional tasks and communicates project goals to the appropriate members of the project team in order to achieve the goals of the team/project.

Next, this chapter will discuss pros and cons of matrix organizations, common reasons why organizations choose to use a matrix structure, and aspects of a matrix system which create unique concerns for managers.

Pros and Cons of Matrix Organizations. There is a considerable amount of literature that focuses on the pros and cons of the matrix organizational structure; however, there is limited literature focusing on the impact of the

matrix (IPT) structure on individuals within an organization. A list of some of the pros and cons of a matrix form of organization are shown in Table 2 below. The benefits of using the matrix/IPT organizational structure include: cross-fertilization of ideas, a focus on objectives, better utilization of time and money, and less duplication of effort in the organization.

TABLE 2

PROS AND CONS OF MATRIX MANAGEMENT

PROS	CONS
* Cross-fertilization of ideas	* Lack of commitment to project by functional personnel
* Project Manager control	* Lack of administrative control of personnel
* Quick decisions on project	* Conflicts of projects
* Better utilization of time and money	* Communication problems
* Do not have to "carry" people	* Competition for resources
* Project Manager has authority to commit the company	* More people required for administration
* Flexibility	* Duplication of effort
* Focus on objectives	* Power conflicts
* Avoids duplication of effort	* Lack of esprit de corps
* Reduce design and development time	

(Chambers, 1989:37)

Common disadvantages of matrix organizations/IPTs include: a lack of total commitment of functional personnel to the project/team, conflicts of projects, competition for resources, and power conflicts (Chambers, 1989:37).

Reasons for Selecting a Matrix Structure/IPTs. The primary reasons for using a matrix structure are to share costly resources, improve lateral communication, avoid duplication of effort, reduce design and development time, and increase participation of functional specialists on project/product teams. Project departments share functional specialists to reduce personnel costs and increase cross-fertilization of ideas between projects. Inter-department communication barriers are reduced and the project manager has improved control when functional specialists report to the project manager (Joyce, 1986:536-537; Chambers, 1989:37).

Unique Aspects of Matrix Organizations. Managing personnel in a matrix type structure has some unique aspects that are less prevalent in typical hierarchical organizations. The most common tendency is increased role conflict for the individual under the two-boss system. Occasionally, specialists receive conflicting directions from both the functional and project manager, which sometimes places the individual in the uncertain position of trying to determine which direction to follow (DiMarco, 1989:11-12). Although estimates and schedules originate in

the functional areas, they normally have to be revised by project managers which can create schedule conflicts.

There is a tendency to overlook explanation of individual roles in the matrix structure. The matrix structure requires new management and communication skills that may not have been developed under the previous functional structure. Therefore, personnel should be trained to adapt to the new matrix process (Heenan, 1989:19).

Another unique management aspect of IPTs/matrix organizations is that project groups consist of members from various functional groups. This situation can lead to intragroup conflicts and decreased intragroup communication requiring managerial intervention (Denis, 1986:151). According to Dyer, "team building helps members develop attitudes more accepting of differences and leads to greater openness and trust" (Nicholas, 1990:222).

With potential conflicts of interest between functional and project departments always having to be carefully managed, why do organizations use IPTs? The next section will answer this question by presenting further pertinent information related to using IPTs.

Integrated Project Teams (IPTs)

The new concept of operations for SPOs within ASC is based upon successfully implementing the new IPT concept. IPTs are the cornerstone of a SPO's integrated approach to

weapons systems development and support. The WSD, Weapon System Director, uses the IPT concept with active participation of members from all functional areas in order to promote a seamless organization. A seamless organization is one which presents a single face (main point of contact) to its customers, and which has centralized control of all its resources and requirements. IPTs bring together the required functional development and support personnel expertise, working across organizational lines, to execute early development, modification, and support programs. Team leaders are responsible for executing assigned programs. IPTs provide development, and support expertise for major modifications or acquisition efforts (DAF, 1992:179).

In a briefing to the sample SPO's top management, Captain Mast, executive officer of the SPO, presented the concepts that, "integrated process teams sit together and use the team approach to process analysis; whereas product teams sit together and use the integrated team approach to program execution" (Mast, 1991a:8). Programs and processes that exceed designed thresholds are evaluated to determine root causes and identify required process improvement. Process and product teams are given the responsibility and authority required for their missions and will be held accountable for process and product execution. Process and program team leaders write civilian and military team members performance ratings and co-sign them with the appropriate functional area chief. Team leaders are held

accountable for rating balance and fairness via their own performance rating. Heads of functional areas allocate resources within the SPO for all programs and processes in addition to the home offices. Functional department heads are also responsible for each employee's training plan, but it is the team leaders which are responsible for executing their team members' training plans.

The next section will briefly discuss goals of the sample SPO which provide the strategic guidance for the new IPT organization to follow.

Goals. SPO management goals within ASC are driven by HQ AFMC goals, and include the following: 1) provide outstanding customer support; 2) employ the Integrated Weapon System Management (IWSM) concept cradle-to-grave; 3) focus the organization on mission success, functional excellence, maximizing people's potential, and developing a leadership team; 4) build a team concept on the principles of Total Quality Management (TQM) to bridge seams or barriers between the functional and geographical areas; and 5) identify improved business practices, recognizing that development activity will continue for the life of a weapon system (DAF, 1992:177-178).

Achieving the SPO goals just presented will only be accomplished effectively by motivating individuals with positive attitudes as described in the next section of literature presented for consideration.

Relationship Between IPTs and Attitude/Motivation

In order to understand how to properly manage individual attitudes/motivation in a matrix organization and on IPTs, it is necessary to understand the interaction between the IPT/matrix environment and the individual needs presented in Table 3.

TABLE 3

BASIC NEEDS OF TEAM MEMBERS

NEEDS	TEAM EXPECTS FROM MANAGER
Sense of belonging	Direction and Leadership
Interest in work itself	Assistance in problem-solving
Professional achievement	Create stimulating environment
Encouragement, pride	Adaptation of new members
Recognition of work	Capacity to handle conflict
Protection from infighting	Resistance to change
Potential for career growth	Facilitate career growth
Job security/continuity	Representation with top management

(Thamhain, 1984:485)

According to William Joyce, the individual's need to have a sense of belonging corresponds to the expectation of individuals for the team/project manager to provide direction and leadership. Individuals assigned to IPTs must maintain ties and loyalty to their old functional boss and department, but must also follow the direction of a new project boss while working as part of the IPT.

Having two bosses who may provide conflicting tasks for the functional specialist can negatively affect the feelings toward direction and leadership. Because the functional specialists are temporary members on the project team, they may have difficulty feeling and believing they are part of the team (Joyce, 1986:547-8).

The next individual need and associated team manager expectation presented in Table 3 was interest in the work itself and assistance in problem solving. Studies done by Jerkovsky report that many of the individuals surveyed expressed overall interest in the work because they usually had broader responsibilities and worked closer to the project than they could have from a functional department. Some functional specialists were less satisfied in this area because they spent little time on the project before they were moved to other projects, and received little support from their functional managers (Jerkovsky, 1983:94).

There is little evidence to indicate negative tendencies in the areas of professional achievement and encouragement from individuals assigned to IPTs. The matrix/IPT structure tends to create a stimulating environment and pride in work because the individuals work closer to the project. However, some specialists are given tasks outside their professional field and are not readily accep.ed into the project's organization (Jerkovsky, 1983:95).

Jerkovsky's studies indicate that the functional specialty of the individual influences whether or not the individual's need for encouragement and recognition is satisfied. Specialists with diverse functional experience and given assorted tasks required less encouragement. However, specialists who were assigned less assorted tasks required more encouragement, and were less able to adapt to the matrix structure (Jerkovsky, 1983:94-96).

Because IPTs are made up of people from a variety of functional areas, there is a greater chance for infighting (Denis, 1986:151). Chambers and Jerkovsky report that job security is a major issue for most members of a matrix organization/IPT because the organization is able to share personnel with other organizations. Some functional specialists located within the project group believe they are not properly represented by higher management and are treated like outsiders in both the functional and project groups. Because functional specialists on an IPT do not work in a functional structure where the career path is apparent, they may become uncertain of their opportunities for career growth while assigned as a member of an IPT within the matrix organization (Chambers, 1989:37-41; Jerkovsky, 1983:93-95).

How IPTs may overcome potential problems related to satisfying team members' individual needs is discussed next in the section on team building.

Team Building. Team building is a management tool which can aid the process of implementing IPTs while trying to satisfy individuals' needs which must be met in order for them to remain motivated. Team building is "the process of creating and then maintaining effective team functioning (Kezsbom, 1989:276)." Team development takes time and commitment, but can lead to higher morale and performance, increased productivity, and more innovative problem-solving. Team building is just a part of the Total Quality Management (TQM) Program which has been implemented throughout ASC to reduce the impacts of organizational change on individuals, and to improve organizations' performance and effectiveness.

Managing Change

It is important to understand the reasons people resist change. Lawrence said, "what employees resist is usually not technical change but social change - the change in their human relationships that generally accompanies technical change" (Lawrence, 1969:145). There are many ways managers can deal with change. One key method is to deal constructively with employee attitudes. This approach includes "emphasizing new standards of performance for staff specialists and encouraging them to think in different ways" (Lawrence, 1969:146). This idea can be applied to the IPT functional personnel that will be serving on a project team. Many times managers think team participation is the best means for dealing with change. While this may work in some

instances, it can also fail to achieve desired results when employee ideas and recommendations are ignored or overlooked.

Resistance to change may not always be bad; however, the potential drawbacks can be reduced by maintaining an awareness of the social and human considerations. Nadler stated that:

> critical issues in managing changes include: (1) managing the political dynamics associated with the change, (2) motivating constructive behavior in the face of the anxiety created by the change, and (3) actively managing the transition state. (Nadler, 1989:195)

Promoting the Team Concept. Movement from a group of individuals to a team is achieved through awareness and effort, and requires a skilled team leader to manage the team building process. Research on group dynamics and the process of team building shows that teamwork is not a mystical process. However, for any group to function together effectively as a team, particularly in the matrix/IPT environment, they must have the essential elements that lead to successful team performance. These elements are: 1) a charter or reason for working together; 2) a sense of interdependence, they must need each other's experience, abilities, and commitment to achieve success; 3) commitment to the benefits of group problem-solving and group decision-making; and 4) accountability as a functioning unit within the organization, demonstrating pride in accomplishments (Kezsbom, 1989:272). Team members

with the help of the "coach" or team leader must recognize their roles and functions within the framework of the team and realize that through these roles, project goals are attainable. Communication within a team must also be "characterized by candor, and feedback, directed at specific team-related actions, and not at personalities. Listening to others as part of a team occurs for understanding rather than defense" (Kezsbom, 1989:272). Obtaining all these elements in an IPT requires the selection of very mature and professional individuals for the team if it is to be successful in the end.

Summary

In general, this chapter presented literature related to the basic matrix structures and IPTs, and the effects of organizational change to IPTs on employee attitudes. First, the working environment in matrix organizations and IPTs was addressed. Second, the importance of understanding the relationship between IPTs and individual attitudes and motivation was discussed. Third, because TQM is the force driving ASC towards IPTs, literature was presented concerning general TQM concepts such as team building; finally, the chapter discussed the importance of managing change and promoting the team concept during the implementation of IPTs.

The next chapter will present the methodology used by this study for analyzing previously collected survey data

from a SPO within ASC. This data was analyzed in order to measure what effects change to IPTs had on individual attitudes within ASC SPOs.

III. Methodology

Introduction

In order to determine if a change in employee attitudes occurred following the change to IPTs, it was necessary to measure employee attitudes before and after the change. This research effort was a formal, longitudinal study that used a One-Group Pretest-Posttest research design to examine what effect an organizational structure change to IPTs had on employee attitudes. This change to IPTs occurred within a SPO that had a form of matrix organization using separate functional departments before it implemented the Integrated Product Team (IPT) structure.

The sample group for this research was an ASC SPO and the population of interest is all the ASC SPOs. As part of a TQM initiative, the SPO began administering surveys to its employees every six months to measure employee attitudes and overall performance. The surveys allowed for a longitudinal study using the SPO secondary data.

The secondary survey data was analyzed prior to and after the complete implementation of IPTs. The average response rate for both surveys was over 70 percent, with a combined average of 262 employees responding out of a possible 370. This number of responses provides a good representation of the overall attitudes of SPO personnel. Because the sample SPO structure is representative of other

ASC SPOs and a large sample was used, the results of this study should have good generalizability.

The SPO's survey questions were selectively aligned with investigative questions developed from the list of individual needs discussed in Chapter Two. The results from the SPO's survey were analyzed using tests of significance (T-tests) to identify significant changes between the mean response scores before and after the change to IPTs. This was done for each of the independent variables listed in the investigative questions.

To further explain the issues introduced above, this chapter presents information in the following areas: 1) research design issues and methods used; 2) major characteristics of the sample and population of interest; 3) the data collection plan which addresses how surveys were scored, grouped, and summarized; 4) key assumptions and limitations of the data; 5) instrument development, reliability, and validity issues; and 6) statistical tests used on the survey data to analyze the investigative questions.

Research Design

In an effort to determine the impact of IPTs on worker attitudes, this study analyzed responses to selected survey questions which were asked before and after the implementation of IPTs within the sample SPO. This type of research design (One-Group Pretest-Posttest Design) is a

type of pre-experimental design. This design is not as strong as a pure experimental design; however, it is much stronger than typical field research designs (Renckly, 1992:11). The chosen research design offers more generalizability (external validity) of results to the population of interest than most standard field research designs.

Under ideal circumstances, this study would have used a Time Series Design to take multiple surveys. However, even though One-Group Pretest-Posttest designs do not use control groups like a true experiment, the multiple administrations of the voluntary survey to a selected sample does provide this research effort with a comparison group. The comparison group's survey responses from before and after restructuring to IPTs were analyzed using t-tests to determine if any significant differences existed in employee attitudes.

History, or the occurrence of a significant event at the same time a variable of interest (change to IPTs) takes place, can have a confounding effect on the analysis of critical data (Campbell, 1963:40). In order to minimize the potentially confounding effect of history (due to the recent reorganization of the SPO), only one set of pretest data (that had been collected after the merger, but prior to the treatment effect of restructuring to IPTs) could be used. Only one set of posttest survey data was collected subsequent to the full implementation of the IPTs.

The voluntary and anonymous manner in which the data was collected by the SPO limited the statistical analysis possibilities for this research. The survey data program sent individual question responses directly to separate question data files to insure anonymity of responses. Therefore, it was not possible to identify individual responses nor demographic information based on the questions.

Because the SPO's database program automatically replaced all old survey data, leaving only the last two sets of data available for statistical analysis, the most appropriate form of research design for this study was the pretest-posttest research design.

As Renckly states, in this form of design (One-Group Pretest-Posttest):

> the effect of the treatment can be seen in the differences between group mean pretest and posttest scores. If these differences are significant, then the treatment can be presumed to be the most probable cause for the change. (Renckly, 1992:52)

Sample and Population Characteristics

As previously stated, the sample selected for this research was an ASC SPO. Since this SPO contained most of the functional areas and job specialties of the other ASC SPOs, it should be representative of other ASC SPOs. Since the SPO had conducted TQM surveys for over four years and had recently implemented IPTs, it was a good candidate for selection as the sample group for this study.

Data Collection Method

The data collection method for this longitudinal study included the use of secondary survey data collected during the SPO's TQM surveys administered in April 1992 and November 1992. The control of variables for this research was limited to ex post facto reporting of what had already taken place within the relevant organization. This study selected the SPO survey questions that related to the variables addressed by the investigative questions developed from the literature in Chapter Two.

The sample SPO administered the survey to its employees every six months to measure employee attitudes and organizational performance. As previously discussed, shortly before the sample SPO changed over to an IPT structure, it underwent a merger with another SPO. The routinely administered surveys included 40 basic questions that were given to only one of the two SPOs prior to the merger. In an effort to achieve a valid comparison of attitudes related to the change to IPTs, only the two sets of voluntary survey responses collected from the combined organization were used. The results of the survey taken two months after the merger of the two SPOs, but prior to the full implementation of the IPT structure, were used as the pretest data. The results of the survey administered six months later, about four months after the full implementation of IPTs, were used for the posttest data. This pretest and posttest data was used to reduce the

potential "historical" effects (response variation) of the merger on the survey responses. As previously mentioned, "history", or an event occurring at or near the same time as a variable of interest or treatment (change to IPTs), can be a confound or threat to internal validity for a pre-experimental (One-Group Pretest-Posttest) form of research design (Campbell, 1963:40).

Only the two sets of voluntary survey responses collected after the reorganization was complete were used in this study in an attempt to minimize any bias or potential historical impacts on individual attitudes which may have resulted from the reorganization of the SPO.

Instrument Selection and Development

In order to determine if a change in employee attitudes was related to the change to IPTs, it was necessary to measure employee attitudes before and after the change. As previously mentioned, the sample SPO was selected because it had an established survey and existing data that measured employee attitudes before and after the change to IPTs.

According to Emory, validity and reliability are two major conceptual considerations which must be taken into account when attempting to obtain an accurate measurement of the sample of the population of interest. Validity contains two major forms, external and internal. Internal validity is the ability of a research instrument to measure what it intends to measure. A type of internal validity is content

validity, which is the extent to which the instrument adequately measures the topic of interest. Criterion-related validity is another form of internal validity which reflects the instrument's ability to predict behavior. Construct validity considers how the objects of the study were developed and how well the test represents those variables. External validity refers to how well the results of the sample data can be applied (generalized) to the entire population of interest (Emory, 1991:179).

Based on the considerations discussed above, some of the questions from the SPO's standard survey provided adequate measures for the investigative questions selected for the study. However, since this study was unable to control the content of the SPO's survey questions and the manner in which responses were collected, the investigative questions could not be measured as rigorously as desired.

Investigative Questions

The following is a list of the investigative questions and their corresponding SPO survey questions which had good content and construct validity. The responses were used to measure the variables of interest addressed in the investigative questions.

Investigative Question #1: What was the effect of this structural change on job interest/**satisfaction**?

Survey question #28: Are you satisfied with your job?

Investigative Question #2: What was the effect of this structural change on **pride in workmanship**?

Survey question #11: Is the work you originate done right the first time?

Survey Question #12: Is the work you originate accepted "as is" the first time you submit it to whomever wants/needs it?

Investigative Question #3: What was the effect of this structural change on **employee recognition**?

Survey Question #20: Does doing your job well lead to recognition and respect?

Investigative Question #4: What was the effect of this structural change on **manager support** of employees?

Survey Question #4 (**personal support**): Does it appear that your supervisors want to help you succeed in your job?

Survey Question #16 (**resources**): Are you provided the resources you need to do your job?

Survey Question #26 (**feedback**): Do you get adequate constructive feedback about how you are doing in your job?

Investigative Question #5: What was the effect of this structural change on **attitudes toward the TQM Program**.

Survey Question #40: Do you believe that TQM is making real and lasting changes for the better in the way the SPO's business is conducted?

Content and Construct Validity and Reliability. The content validity and reliability of the SPO's survey instrument questions were unknown because the original

survey was developed by a contracted organization, and no data was available on any reliability testing of the instrument itself. However, the wording and intent of the survey questions have good content and initial construct validity in relation to the variables covered in the investigative questions. The survey questions, and the anchored response scales used by the surveys are shown in the Appendix of this report.

Investigative question (IQ) #4 had three related survey questions, and IQ #2 had two. The other three IQs had one related survey question each. Since the survey data was compiled without regard to individual cases, reliability testing of the survey questions could not be accomplished. However, the wording of the survey questions, combined with the conservative approach used by the research team to pair survey questions with IQs, added face (content) and construct validity to measure the underlying dimensions of the variables of interest.

Because the 262 (average) responses to the survey represent most job functions/specialties within ASC SPOs, the results should provide generalizability (external validity) to the population of interest.

Random Error. In an effort to reduce the possible affects of random error on survey responses, the SPO took the following precautions: 1) tests were administered within controlled testing sessions, which helped reduce distractions that could have led to random error in the

data; 2) questions were positively worded to minimize biasing of the results; and 3) responses to similar questions were compared to assure internal consistency.

Analysis

As stated above, the SPO's survey questions were selectively aligned with the investigative questions. The underlying Test of Hypothesis for this study is to determine if a significant difference in the mean responses (scores) from before and after the change to the IPT structure exists. If a significant difference exists, it can be presumed that the treatment effect (restructuring to IPTs) is the most probable cause for a change in employee attitudes (Renckly, 1992:52).

Survey questions were constructed on a Likert type 10 point scale. Using an average of 262 responses (out of a possible 370 responses to each question) from the pretest and posttest surveys, this study used a test of significance (t-test) to identify any significant changes, or differences, in each of the independent variables listed in the investigative questions.

The computed t-value was compared to the t-value obtained from a table of t-values at the .05 level of significance. This level of significance was selected to lend more power to any significant findings from the research data. Renckly stated:

> If the computed t-value is larger than the tabled t-value, it indicates that there is a significant

> difference between the two sample (and their respective population) means. (Renckly, 1992:53)

Variable mean scores which may have changed significantly from the pretest sample group to the posttest sample group reflect a relationship between employee attitudes and the IPT organizational structure.

Investigative questions with multiple, pertinent survey questions were analyzed by doing tests of significance based upon the averages of the means and variances of the related questions, for both pre and post test survey data. Due to the large sample size, the average means and variances could be used for the t-tests for each variable with multiple survey questions.

Conclusion

This chapter presented the methodology used in this longitudinal study which attempted to analyze the effects of changing to IPTs on individual attitudes. The chapter addressed issues pertaining to: the research design of the study, how the data was collected, characteristics of the sample and population, survey instrument development issues, and how the data was analyzed to answer the research and investigative questions. The next chapter will present the results of the statistical analyses (t-tests) conducted on the secondary survey data collected by the sample SPO.

IV. Results

Introduction

As discussed in Chapter Three, this study analyzed the sample SPO's survey questions to determine if there were any significant changes in the average responses of individuals to survey questions after the change to the IPT structure. This chapter reviews the results of the survey based upon the investigative questions. First it addresses the premise of the test, followed by analysis and discussion of the results for each question.

Premise

For the purpose of this analysis, the null hypothesis (H_o) that there was no significant difference between the mean response before the change (μ_1), and the mean response after the change (μ_2) was tested. This null hypothesis was chosen contrary to the literature because a null hypothesis cannot be statistically proven to be true (Henkel, 1987:37). However, failure to accept this null hypothesis will support the alternative hypothesis (H_a) that a change to a matrix (IPT) structure does have an effect on attitudes.

A confidence level (CL) of 95 percent was used for this test. A test of significance using H_o, H_a, test statistic (TS), and rejection region (RR), was used to analyze mean response scores and standard deviations for each IQ. A two

tailed test of significance (t-test) was used for each question in the following test of hypothesis format:

H_o: $\mu_1 - \mu_2 = 0$

H_a: $\mu_1 - \mu_2 \neq 0$

TS: $t = [(X_1 - X_2)] / \sigma_{x1-x2}$ $\quad \sigma_{x1-x2} = \sqrt{\sigma^2_1/n_1 + \sigma^2_2/n_2}$

RR: $t < -t_{\alpha/2}$ or $t > t_{\alpha/2}$ $\quad$ RR = $t < -1.965$ or $t > 1.965$ for a 95% confidence level.

Results

The sample SPO achieved a 74 percent (274 out of 370) response rate on the pretest survey, and a 67.8 percent response rate (251 out of 370) on the posttest survey. This produced an average response rate of 72 percent for both of the computerized surveys made available to all SPO personnel on a strictly voluntary and anonymous basis. Given that this survey was available to 100 percent of the employees, it can be assumed that the 72 percent average response rate provides a good representation of individual attitudes in the sample SPO.

The pre and post survey means and variances, along with the calculated test statistics for each of the four investigative questions are shown in Table 4. As stated in Chapter Three, the survey was based on a response scale ranging from 1 to 10, with 1 being "outstandingly bad" and 10 being "outstandingly good."

TABLE 4

STATISTICAL RESULTS OF SURVEY DATA

Question	X_1	X_2	σ_1	σ_2	TS*
1	6.59	6.78	2.41	2.41	-0.90
2	7.37	7.25	1.70	1.81	0.74
3	6.38	6.35	2.33	2.31	0.14
4	6.87	6.75	2.32	2.35	0.63
5	6.56	6.55	2.31	2.21	0.05

Analysis of Results

Frequency histograms of survey question responses are shown in the Appendix. The following are the results of the analyses conducted on the survey question data related to the investigative questions:

Investigative Question #1: What was the effect of this structural change on job interest/satisfaction?

The change to IPTs did not significantly affected employee job interest/satisfaction. There was a non-significant average improvement from 6.59 to 6.78 out of a potential high score of 10. The variance of 2.41 for both pretest and posttest data shows there was considerable variability in responses to this question. All points on the ten point scale received at least 5 percent of the responses. The most common responses before and after the change to IPTs were 8 and 9 in sequence. This does reflect a relatively high level of job interest/satisfaction.

Investigative Question #2: What was the effect of this structural change on pride in workmanship?

The responses to the two survey questions related to the variable pride in workmanship were averaged for a mean of 7.37 and 7.25 before and after the change, respectively. Although this was an insignificant change, it had the highest average score on the response scale among the investigative questions. It also had the lowest variability of response of all five investigative questions/variables.

Investigative Question #3: What was the effect of this structural change on employee recognition?

The responses to this question showed no significant change in employee recognition; however, the mean scores of 6.38 and 6.35 before and after the change, were the lowest scale responses to the questions in this study. The modal response was 8; however, each of the responses below 6 ranged from 8 to 20 percent of the sample.

Investigative Question #4: What was the effect of this structural change on manager support of employees?

Three survey questions mean responses were averaged to measure this variable of interest. The combined scores showed an insignificant decline in attitudes toward management support from 6.87 to 6.75. Each of the points on the scale received at least ten percent of the responses.

Investigative Question #5: What was the effect of this structural change on attitudes toward the TQM Program?

The survey results showed there was no significant change in attitudes toward TQM after the change to IPTs. The mean score declined slightly from 6.56 to 6.55 with

little change in the range of responses, or in the variability of responses.

Summary

Based on the results of the test statistics for each question above, the survey data does not provide evidence (fails) to reject the null hypothesis that there was no significant change in attitudes before and after the change to IPTs. In essence, the change to IPTs had negligible effects on the employee attitudes measured in this study. This study was unable to report data by job function or demographic breakdown to determine if there was change in attitudes within specific groups.

Chapter Five discusses these statistical findings further, and presents pertinent discussion and recommendations related to their outcomes.

V. Findings and Recommendations

Introduction

This chapter presents the following: 1) the findings of the statistical analysis conducted on the research data presented in Chapter Four; 2) discussion and interpretation of the results; and 3) strengths and limitations of the findings. This study concludes by presenting recommendations for organizations considering implementing IPTs, and for possible future research efforts which may be conducted on this topic.

Findings

As presented in Chapter Four, the results of the statistical analysis (test of significance) for each of the five investigative questions reflected no significant changes in individual attitudes before or after the implementation of IPTs. Literature presented in Chapter Two dealing with organizational change and matrix organizations suggests that some measure of change in attitudes, due to the implementation of IPTs within a matrix form of organization, is expected. This study found no effect. The literature suggests that no effect is possible because attitude change can be reduced or eliminated with proper planning and management.

No significant change in attitudes suggests the change to IPTs may have been managed well. The results may also indicate that IPTs are transparent to already established

matrix organizations. A significant difference in attitudes would suggest the possibility of poor change management, or IPT problems.

Discussion and Interpretation of Results

The following discussion presents plausible research and organizational issues that support the findings of this study.

Research Issues. Positive aspects of this study include the use of the following: a large sample, a stronger than normal field research design, and a sample group representative of the population. These positive factors give the findings of the research analysis more strength in their generalizability to the entire population of interest. Continuation of this study over a longer period of time could show a change in attitudes as suggested by the literature. For example, a longer study might show a change in attitudes as individuals become more aware of the IPT environment and its effect on their careers.

Organizational Issues. Organizational issues that provide plausible explanations for the lack of change are: 1) there was minor differences between IPTs and the SPO matrix structure that significantly impact individual attitudes; 2) TQM training within the organization was communicated and accepted by individuals so that change was more readily accepted; and 3) individuals may not be fully

aware of the long range impact to their careers under the new organizational structure.

Strengths and Limitations

The use of two identical surveys collected before and after the change to IPTs provided excellent longitudinal data not typically available for most studies. The people within the sample are representative of other ASC SPOs; this representation provides good external validity and valuable information for future studies on IPTs.

As stated in Chapter One, one limitation of this study was the lack of control in the development and administration of the SPO's survey. Another limitation was the lack of multiple surveys both before and after the change to IPTs. Although use of single surveys before and after the change to IPTs provides strong data for a longitudinal study, the study could be enhanced if multiple surveys were available to do a time series analysis. A time series analysis would facilitate discovery of attitude changes after the IPT structure has been in place for a longer period of time.

The next section discusses the findings, recommendations for other organizations planning on implementing IPTs, and recommendations for future research directions.

Discussion and Recommendations

The SPO at Wright-Patterson AFB, selected for this study, is a good example of a service-oriented (contracting) military organization. It serves not only the public interest as a government contracting organization, but also provides assistance to all DOD service branches. The results of this study suggest SPO management may have been successful in spreading the TQM philosophy to individuals within the organization.

Recommendations. Organizations implementing IPTs should be aware of the following considerations that minimize detriments to performance: 1) Manage change by considering the dynamic affect the change has on human relationships; 2) Use TQM to establish a sense of interdependence, commitment and accountability when implementing change; and 3) Keep individual needs and attitudes in mind to improve performance. Managers have tools available to them to minimize detrimental effects of individual attitude changes on organizational performance.

Some of the tools available to minimize the effects of change on individuals and ultimately organizational performance are as follows: 1) Use TQM as a tool to motivate individuals; 2) Select and train project managers/leaders carefully with technical expertise and the ability to manage people; 3) Manage change, instead of letting change manage the organization; and 4) Use team building techniques and teamwork.

Future Research Directions. The second area of recommendations is related to future research directions. Because of its strong research design and supporting literature, this study could be used as a baseline by future researchers to further explore affects of IPTs on individual attitudes. Future research should analyze IPTs which have been functioning within stable organizations (SPOs) over a longer period of time than was available for this study. A follow-on study could collect further data to determine if an upward or dowrward attitudes trend was occurring. This could not be discerned through this study.

Future studies could examine the following aspects of individual attitudes and IPTs: 1) examine more attitudinal variables expressed in Chapter Two, but not addressed by the secondary data; 2) study a commercial, "profit based" organization, similar to a SPO, to determine differences between for profit and non-profit organizations; 3) continue this study over a longer period of time using time series design; 4) implement changes in data collection methods by including demographic information for more in-depth analysis of data, and provide the ability to do reliability testing of questions; and 5) conduct similar studies on the other ASC SPOs to test the representativeness of the secondary data to the entire population. This would add more power to the findings of this study.

Conclusion

Unexpected analysis results are one of the things which can make research interesting for researchers and readers alike. Having no significant changes in attitudes after implementing a dynamic organizational change is an interesting outcome that requires further evaluation. Ignoring the human aspect when undergoing an organizational change may have a detrimental effect on the organization. The following quote, from Machiavelli, The Prince (1514), best addressed the reason for concern when undergoing change:

> It must be considered that there is nothing more difficult to carry out, nor more doubtful of success, nor more dangerous to handle, than to initiate a new order of things. For the reformer has enemies in all of those who profit by the old order, and only lukewarm defenders in all those who would profit by the new order, this lukewarmness arising partly from fear of their adversaries, who have the laws in their favor; and partly from the incredulity of mankind, who do not believe in anything new until they have actual experience of it. (Mast, 1991b:25)

Proper management of change can be beneficial to the organization by instilling a sense of excitement for new opportunities and growth. To properly introduce and manage change in an organization, such as implementing IPTs, managers must understand the impacts that change may have on individual employee attitudes, because attitudes and motivation drive performance.

This study presented a longitudinal study of the effects of implementing IPTs on individual attitudes. Employees from a SPO at WPAFB served as the sample group for

the study, with all ASC SPOs being the population of interest. This research was conducted in an effort to analyze what effect a change to IPTs has on individual attitudes. Many interesting findings were uncovered during the course of the research, leading the researchers to present recommendations for future studies.

IPTs are the way of the future for contracting SPOs. When implementing new changes of any kind, managers should be mindful of the effects of their decisions on the individuals being impacted by the change. Individuals' attitudes affect their motivation and performance levels, which ultimately affect the performance of the organization as a whole. The results of this study suggest change may have been properly managed as there was no change in attitudes.

Appendix: SPO Survey Data Results

PARTICIPATION

89b 188/236 = 79.66%
90a 199/242 = 82.23%
90b 209/226 = 92.48%
91a 164/269 = 60.97%
92a 274/385 = 71.17%

QUALITY CULTURE SURVEY

Instructions: Please find the number on the rating scale given below (1-10) which best describes your reaction and/or observations for each question. Any reference to means throughout the SPO.

OUTSTANDINGLY BAD
NOT AT ALL
NONEXISTENT
1 2 3 4 5 6 7 8 9 10
OUTSTANDINGLY GOOD
EXTREMELY
ALL THE TIME
TOTALLY

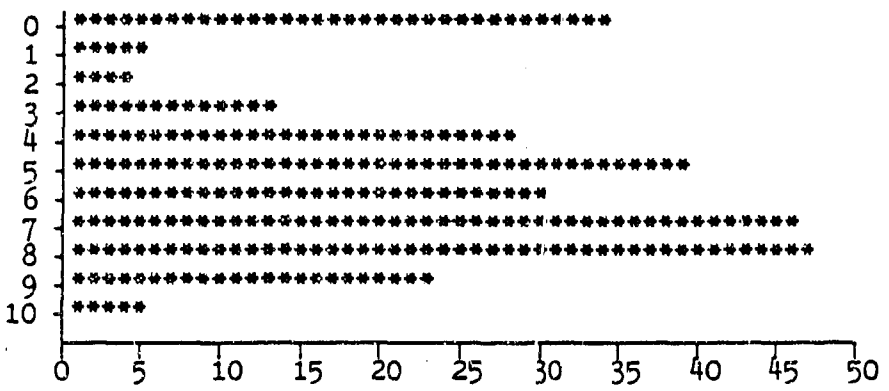
89b	90a	90b	91a	92a	MAX RATING		
9.	8.9	9.2	8.9	8.7	10	1.	Is it important to you that we in be able to improve the way we do things if an improvement is suggested?
6.5	6.7	6.9	7.2	6.3	10	2.	Does appear quick to use improved work methods?
6.1	6.7	6.8	7.	6.2	10	3.	Are your proposals accepted when you propose a better way to do something?
6.9	8.	8.1	7.8	7.3	10	4.	Does it appear that your supervisors want to help you succeed in your job?
7.	7.4	7.6	7.6	6.7	10	5.	Is open to change?
7.7	8.	8.1	8.1	8.	10	6.	Are the people who receive your reports, letters, briefings, studies, etc. (products) happy with your work?
8.7	8.5	8.6	8.6	8.3	10	7.	Are you aware of what the Air Force pays to do?
7.9	8.1	8.3	8.3	7.7	10	8.	Does do the job the Air Force pays it to do?
8.7	8.6	8.5	8.6	8.	10	9.	Do you clearly understand your directorate's mission?
5.7	6.	6.4	6.5	5.7	10	10.	Is duplication of effort avoided in ?
7.5	7.5	7.9	7.8	7.8	10	11.	Is the work you originate done right the first time?

89b	90a	90b	91a	92a	MAX RATING		
6.8	7.1	7.4	7.5	6.9	10	12.	Is the work you originate accepted "as is" the first time you submit it to whomever wants/needs it?
6.7	6.6	6.8	7.	6.6	10	13.	Is other peoples' work done right the first time?
7.2	7.2	7.6	7.4	6.4	10	14.	Do you have clear-cut and reasonable goals established in your 3-Ltr?
7.9	7.7	7.5	7.7	6.6	10	15.	Do you feel you're part of a team in your 3-Ltr directorate?
7.1	7.3	7.3	7.1	7.	10	16.	Are you provided the resources you need to do your job?
6.1	6.8	6.8	7.1	6.	10	17.	Are communications within effective and sufficient?
6.3	6.9	6.9	7.1	6.4	10	18.	Do people/directorates work well with each other?
6.2	6.5	7.	7.1	5.8	10	19.	Are people asked for their input on decisions that will affect them?
6.7	7.1	7.2	7.1	6.4	10	20.	Does doing your job well lead to recognition and respect?
7.7	7.9	7.7	7.7	7.1	10	21.	Does your supervisor encourage exchange of ideas and opinions?
6.6	6.9	7.	6.7	6.6	10	22.	Does your supervisor use group meetings to solve problems?
6.8	7.1	7.	7.2	6.4	10	23.	Is communication within your directorate effective?
7.4	7.5	7.5	7.4	7.1	10	24.	Are your supervisor's instructions adequate to enable you to meet his/her expectations?
6.7	6.9	6.9	7.	6.4	10	25.	Are work activities sensibly organized in your directorate?
6.7	6.9	6.9	6.9	6.3	10	26.	Do you get adequate constructive feedback about how you are doing in your job?
7.7	8.3	8.3	8.2	8.1	10	27.	Does your work contribute to mission?
7.1	7.2	7.1	7.4	6.6	10	28.	Are you satisfied with your job?

89b	90a	90b	91a	92a	MAX RATING		
7.4	8.1	8.1	8.	6.9	10	29.	Do you think the FOG supports TQM?
7.5	7.8	8.	7.8	6.8	10	30.	Do you think the 3-Ltr directors support TQM?
6.8	7.3	7.5	7.3	6.7	10	31.	Do you think the 4-Ltr supervisors support TQM?
6.7	6.5	6.8	6.9	6.4	10	32.	Are OIs and regulations followed?
8.3	8.1	8.2	8.	7.8	10	33.	Are you aware of your job description and expectations?
7.	7.2	7.2	7.1	6.6	10	34.	Does what you actually do match your job description?
6.8	6.8	6.9	6.8	6.4	10	35.	Is your job performance accurately measured?
6.1	6.1	6.4	6.2	5.7	10	36.	Do meetings you attend start and end on time?
6.2	6.5	6.4	6.5	6.2	10	37.	Are meetings you attend effective?
6.4	6.5	6.5	6.5	6.2	10	38.	Are meetings you attend necessary?
7.3	7.6	7.6	8.	7.7	10	39.	To what extent is your knowledge of TQM?
6.6	7.5	7.6	7.6	6.6	10	40.	Do you believe that TQM is making real and lasting changes for the better in the way business is conducted?

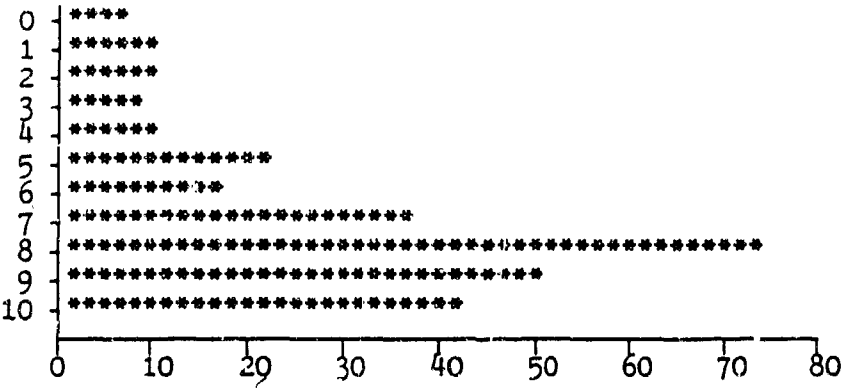
COMPOSITE QUALITY CULTURE SURVEY RESULTS
04/08/92

Question 3



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
274	34	6.22	2.01

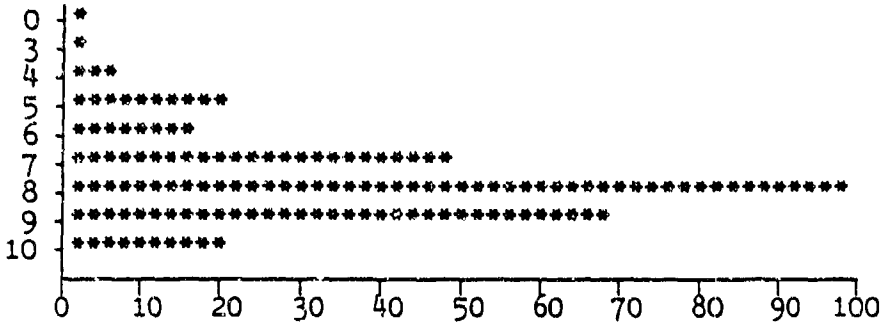
Question 4



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
274	5	7.28	2.34

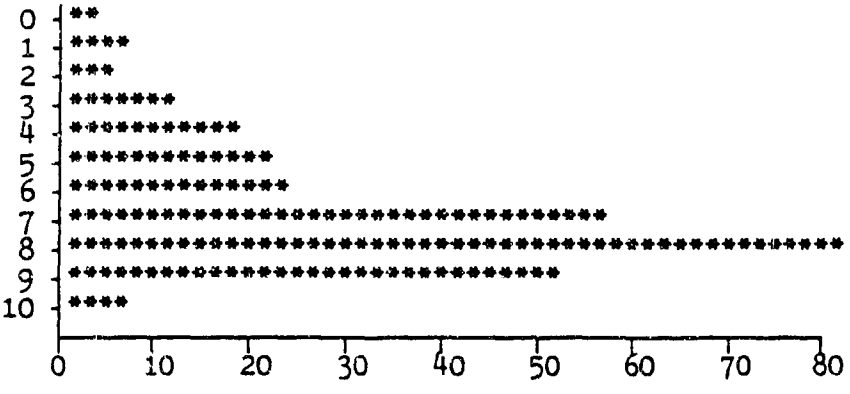
COMPOSITE QUALITY CULTURE SURVEY RESULTS
04/08/92

Question 11



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
274	1	7.79	1.41

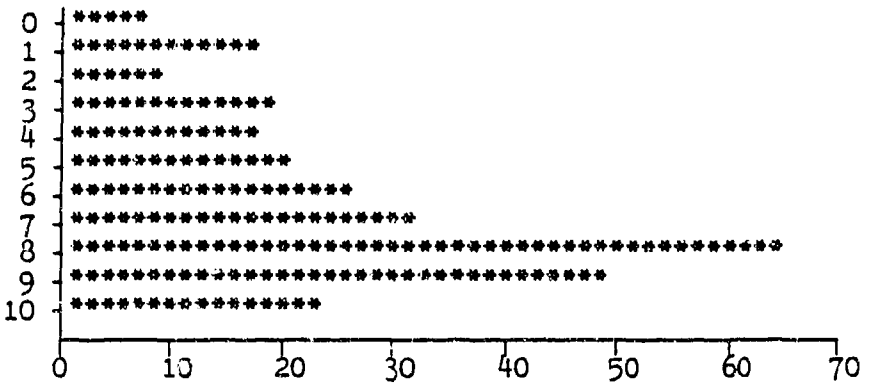
Question 12



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
274	2	6.94	1.99

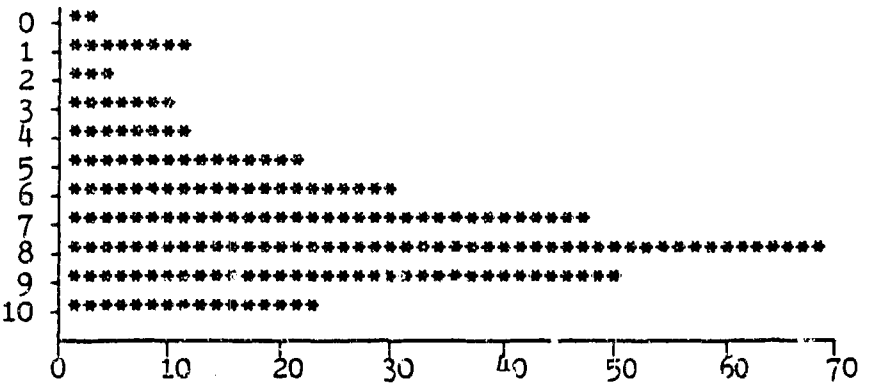
COMPOSITE YT QUALITY CULTURE SURVEY RESULTS
04/08/92

Question 15



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
274	6	6.62	2.57

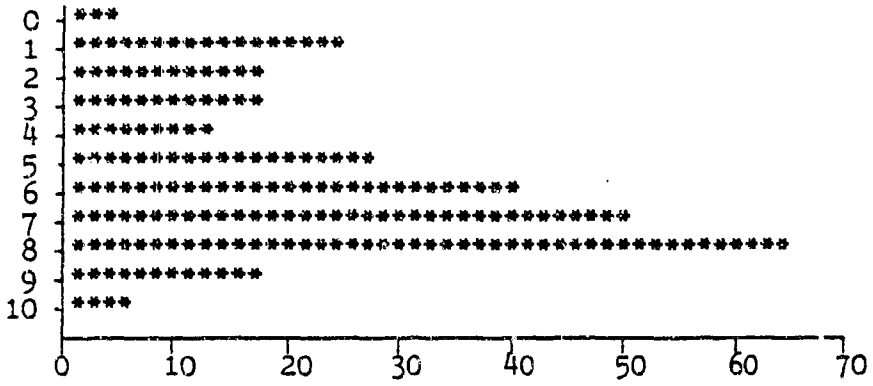
Question 16



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
274	2	7.03	2.21

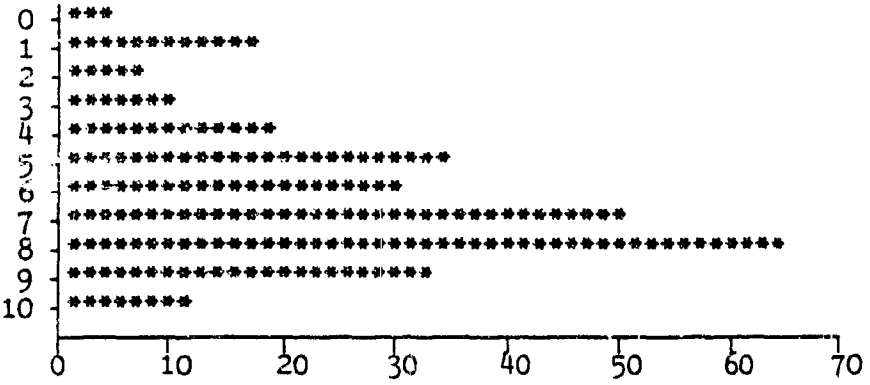
COMPOSITE QUALITY CULTURE SURVEY RESULTS
04/06/92

Question 19



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
274	4	5.84	2.45

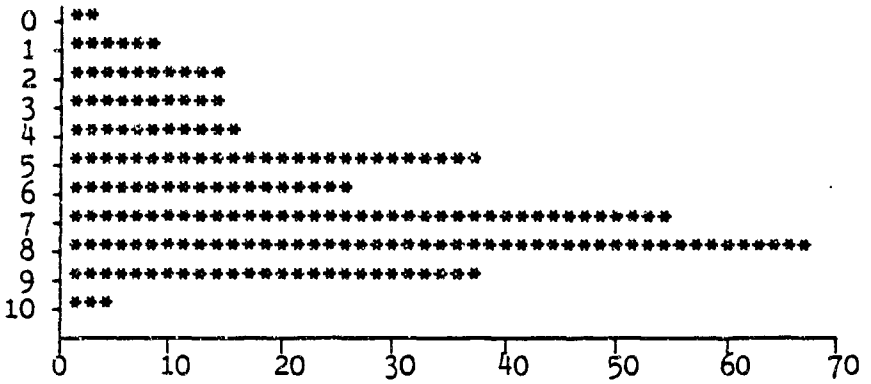
Question 20



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
274	3	6.38	2.33

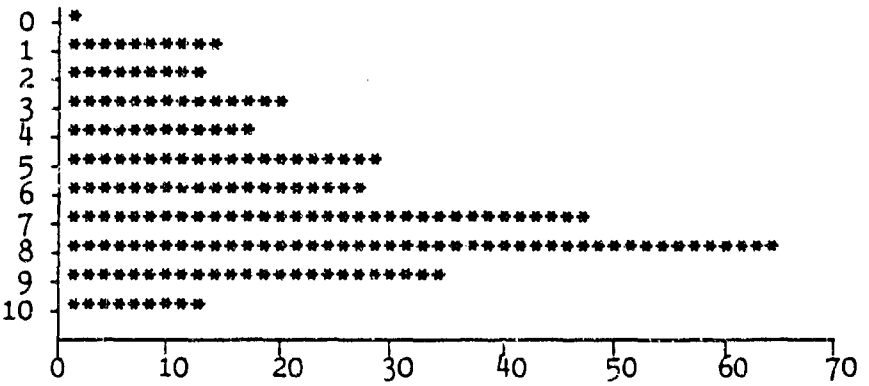
COMPOSITE QUALITY CULTURE SURVEY RESULTS
04/08/92

Question 25



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
274	2	6.39	2.20

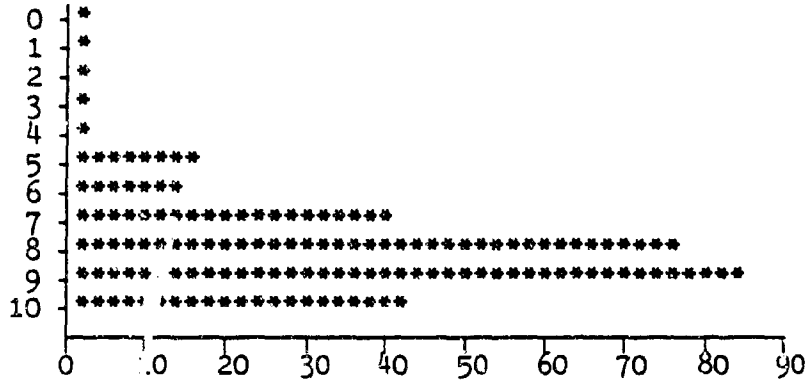
Question 26



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
274	1	6.32	2.41

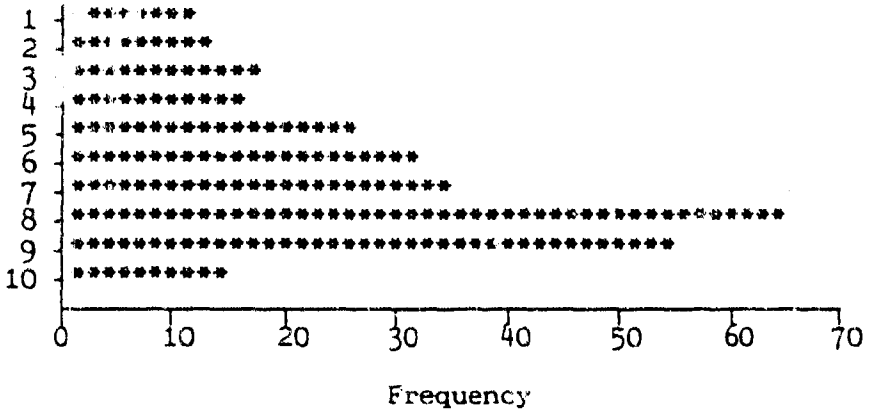
COMPOSITE QUALITY CULTURE SURVEY RESULTS
04/08/92

Question 27



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
274	1	8.10	1.54

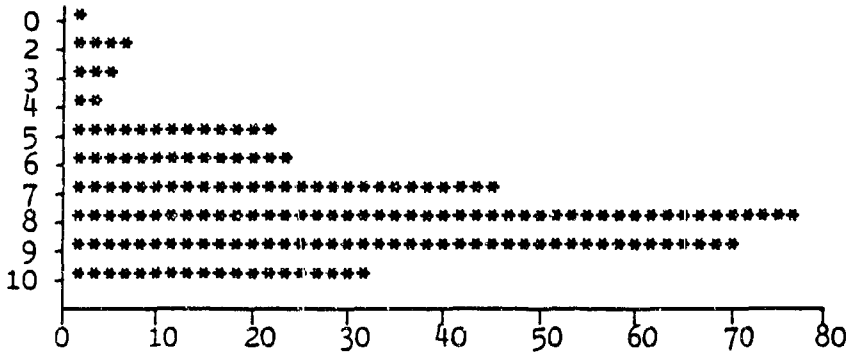
Question 28



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
274	0	6.59	2.41

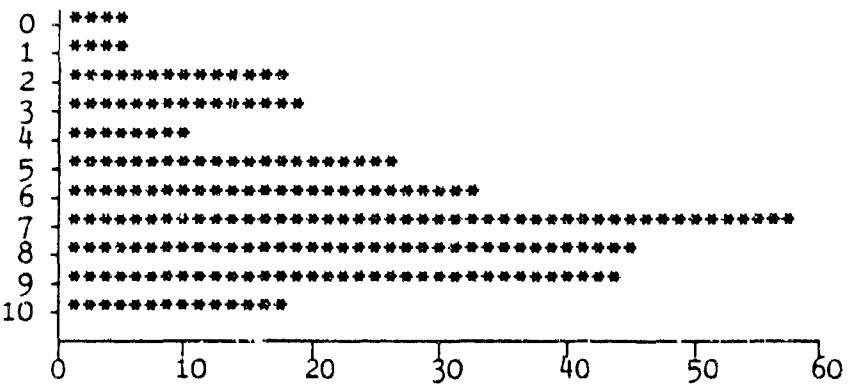
COMPOSITE QUALITY CULTURE SURVEY RESULTS
04/08/92

Question 39



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
274	1	7.69	1.73

Question 40



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
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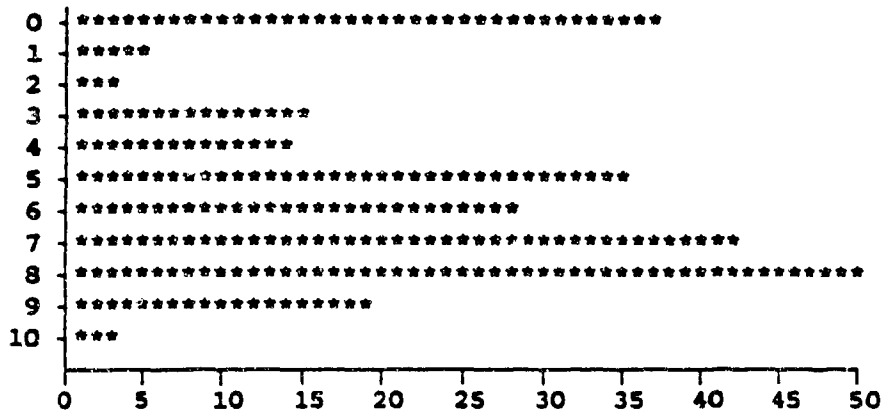
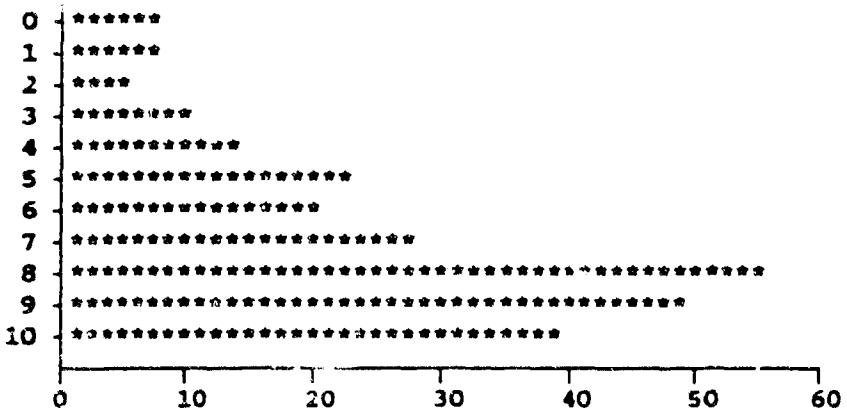
COMPOSITE QUALITY CULTURE SURVEY RESULTS
11/20/92

Question 3



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
251	37	6.31	1.99

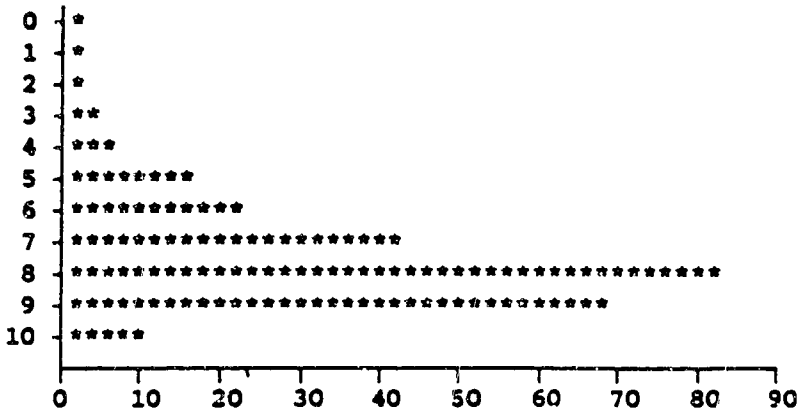
Question 4



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
251	7	7.23	2.35

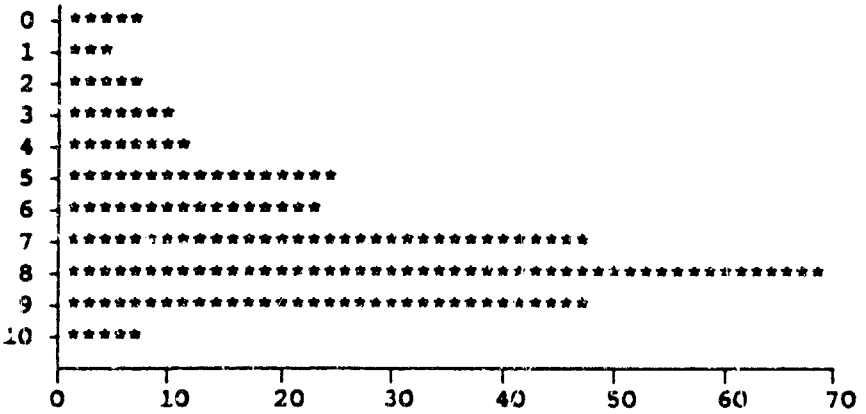
COMPOSITE QUALITY CULTURE SURVEY RESULTS
11/20/92

Question 11



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
251	2	7.59	1.59

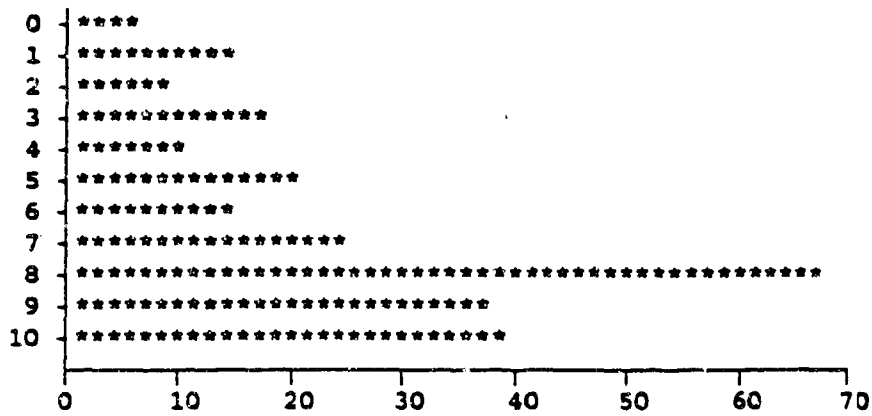
Question 12



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
251	6	6.91	2.03

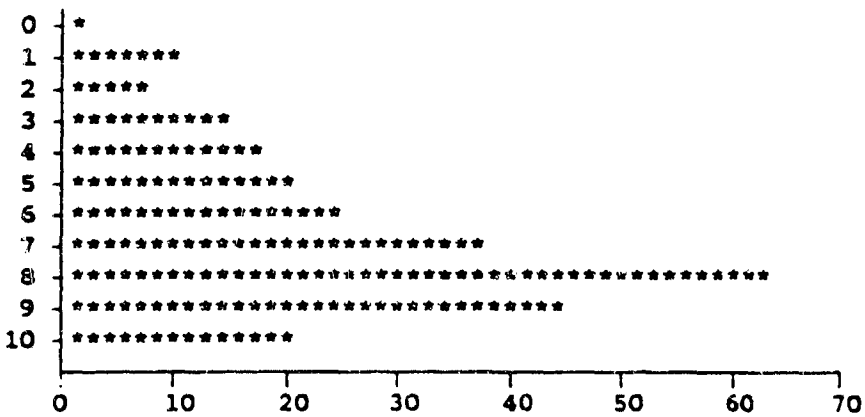
COMPOSITE QUALITY CULTURE SURVEY RESULTS
11/20/92

Question 15



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
251	5	6.92	2.64

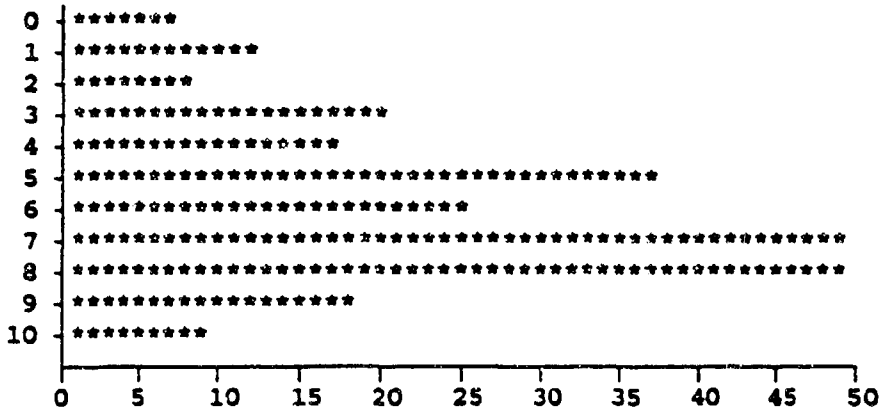
Question 16



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
251	1	6.82	2.34

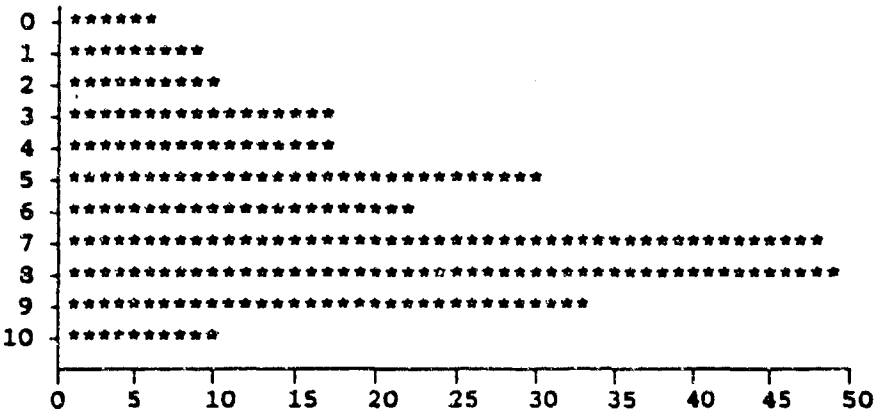
COMPOSITE ; QUALITY CULTURE SURVEY RESULTS
11/20/92

Question 19



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
251	7	6.06	2.28

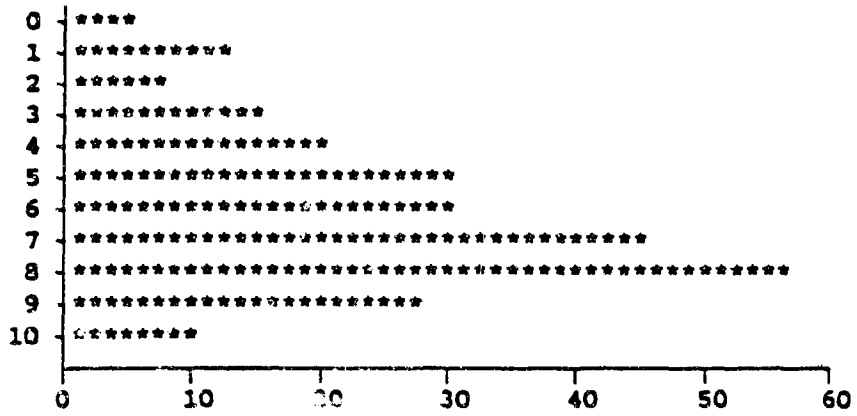
Question 20



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
251	6	6.35	2.31

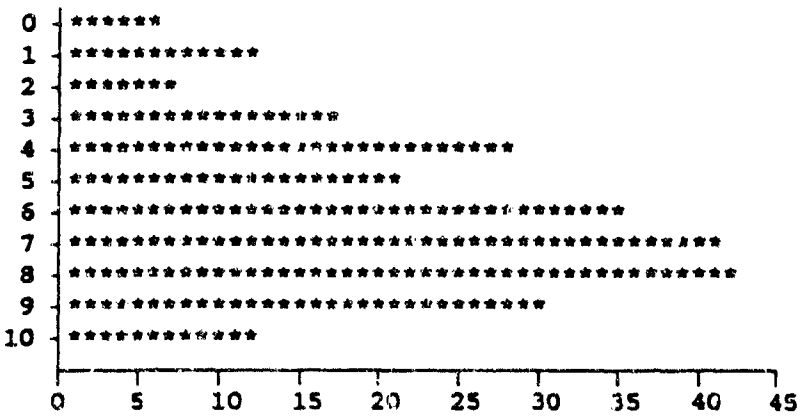
COMPOSITE QUALITY CULTURE SURVEY RESULTS
11/20/92

Question 25



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
251	5	6.31	2.28

Question 26



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
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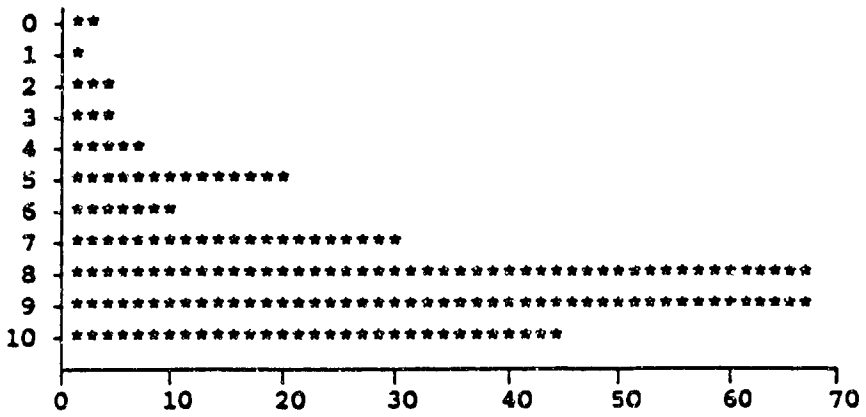
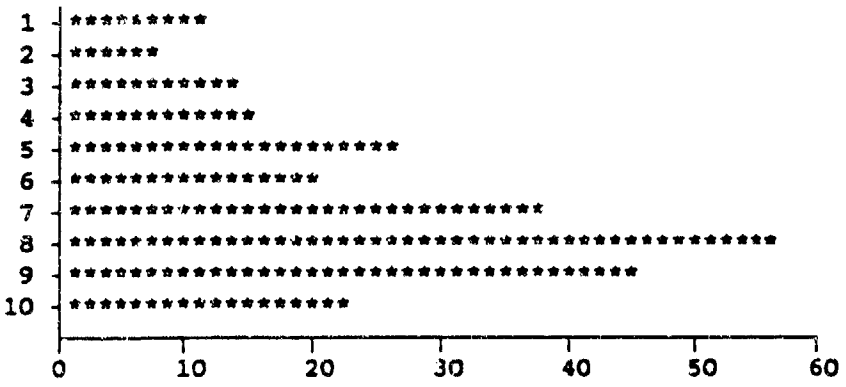
COMPOSITE QUALITY CULTURE SURVEY RESULTS
11/20/92

Question 27



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
251	2	7.92	1.82

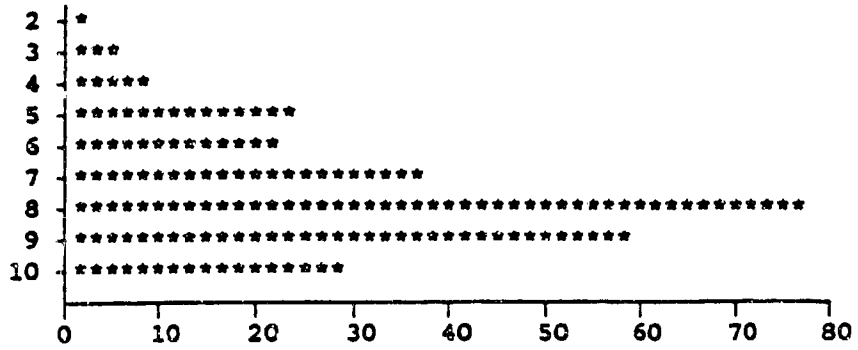
Question 28



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
251	0	6.78	2.41

COMPOSITE QUALITY CULTURE SURVEY RESULTS
11/20/92

Question 39



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
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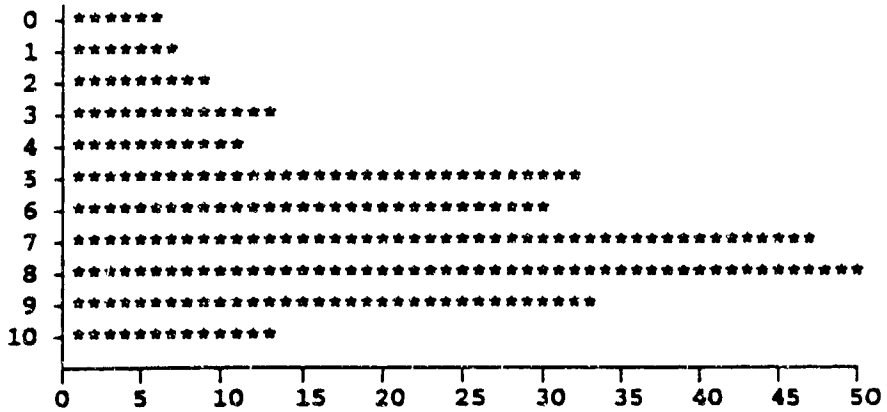
Question 40



TOTAL RESPONSES	TOTAL N/A RESPONSE	MEAN	STANDARD DEVIATION
251	6	6.55	2.21

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Vita

Mr. Joseph A. Paul was born on 28 March 1962 in Milwaukee, Wisconsin. He graduated from Fairmont East High School in Kettering, Ohio in 1980 and attended the University of Dayton, graduating with a Bachelor of Science in Business (major: Marketing, minor: Management) in July 1984. He began his career in the Air Force Civil Service as a supply manager at the International Logistics Center (ILC) at Wright-Patterson AFB, Ohio. From 1985 to 1987 he served as a follow-on logistics support manager at the ILC for the countries of Turkey and Belgium. From 1988 to 1992 he served as the Logistics Program Manager at the ILC for new F16 sales to the Netherlands and Egypt until entering the School of Logistics and Acquisition Management, Air Force Institute of Technology, in May 1992. As the Logistics Program Manager he was responsible for directing and evaluating all logistics support from the sight survey through full operational capability. During his time as Logistics Program Manager he interacted daily with the F16 System Program Office and overlooked the logistics functional support for the F16 Security Assistance Program Manager.

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Kettering, Ohio 45440

Vita

Captain Roger D. Stull was born on 9 August 1962 in Beach, North Dakota. He graduated from Mott Lincoln High School in Mott, North Dakota in 1980 and attended The University of Kansas, graduating with a Bachelor of General Studies in Psychology in January 1985. Upon receiving a reserve commission in the USAF in September 1986, he served as the Director of Personnel and Administration for the USAF Clinic, Peterson AFB, Colorado. In April 1989 he was selected to serve as the Director of Medical Logistics, Plans, and Readiness, for the USAF Clinic, San Vito AS, Italy, responsible for millions of dollars of medical supplies, equipment, and facilities; all medical readiness programs; and was also assigned as the project officer for its $1.2 Million renovation project. He also later served as the Director of Medical Resources, Plans, Readiness, and Systems. While at San Vito AS, he was selected as the Air Force Medical Readiness Officer-of-the-Year for 1991, and Company Grade Officer-of-the-Year for San Vito for 1991. In April 1992 he entered the School of Logistics and Acquisition Management, Air Force Institute of Technology, in the Masters of Science in Logistics Management program.

Permanent Address: Rural Route 6, Box 267
Minot, N. D. 58701

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	September 1993	Master's Thesis

4. TITLE AND SUBTITLE
A LONGITUDINAL STUDY OF THE EFFECTS OF ORGANIZATIONAL CHANGE TO INTEGRATED PRODUCT TEAMS (IPTs) ON EMPLOYEE ATTITUDES

5. FUNDING NUMBERS

6. AUTHOR(S)
Roger D. Stull, Captain, USAF
Joseph A. Paul, GS-12, USAF

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
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11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT
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12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)* This study examines what effect an organizational change to Integrated Product Teams (IPTs) within a System Program Office (SPO) has on employee attitudes. Chapter One of this study presents the general research problem/issue, pertinent background information, definitions of important terms, investigative questions, limitations of the research, and a general overview of the thesis. Chapter Two describes the IPT (matrix) organizational environment, presents literature establishing the relationship between individual attitudes, motivation, performance, and explores the relationship between IPTs and employee attitudes. Chapter Three presents the methodology used to analyze the SPO's survey data collected before and after implementation of IPTs. Finally, Chapters Four and Five present the survey data results, findings of the analysis, and recommendations for organizations interested in implementing IPTs. The SPO surveys conducted during study suggest the change to IPTs was properly managed as there was no change in attitudes.

14. SUBJECT TERMS	15. NUMBER OF PAGES
Organization Change, Product Teams, Employee Attitudes	81
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UL

AFIT Control Number AFIT/GLM/LAR/93S-3?

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a. Yes b. No

2. Do you believe this research topic is significant enough that it would have been researched (or contracted) by your organization or another agency if AFIT had not researched it?

a. Yes b. No

3. The benefits of AFIT research can often be expressed by the equivalent value that your agency received by virtue of AFIT performing the research. Please estimate what this research would have cost in terms of manpower and/or dollars if it had been accomplished under contract or if it had been done in-house.

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4. Often it is not possible to attach equivalent dollar values to research, although the results of the research may, in fact, be important. Whether or not you were able to establish an equivalent value for this research (3, above) what is your estimate of its significance?

a. Highly Significant b. Significant c. Slightly Significant d. Of No Significance

5. Comments

_____ _____

Name and Grade Organization

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